

Preserving and Balancing Ecosystems: Strategies to Mitigate Human-Elephant Conflict Through Law

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ABSTRACT: This paper focuses on addressing the issue of human-elephant conflict in India by implementing mitigation strategies, with a specific emphasis on Indian legislation. Human-elephant conflict is a significant problem in India as the shrinking habitats of elephants and the expansion of human settlements lead to encounters that pose risks to both humans and elephants. The paper provides an overview of the factors contributing to human-elephant conflict in India, such as habitat loss, encroachment, and resource competition. It then explores the legal framework related to wildlife conservation and protection in India, particularly highlighting the Wildlife Protection Act of 1972 and relevant policies and guidelines. Various mitigation strategies are discussed to reduce human-elephant conflict, including habitat management and restoration, community participation and awareness, elephants' welfare and relocation, crop protection and compensation, and the use of early warning systems and technology. The study emphasizes the significance of Indian legislation, particularly the Wildlife Protection Act, in guiding and supporting these mitigation strategies. It acknowledges the challenges and limitations associated with their implementation and provides recommendations to enhance conflict mitigation efforts. By examining the intersection of human-elephant conflict and Indian legislation, this study contributes to a better understanding of the legal and policy framework for managing such conflicts. It provides valuable insights for policymakers, wildlife authorities, and conservation practitioners in developing effective strategies to mitigate human-elephant conflict in India.

KEYWORDS: human-elephant conflict, mitigation strategies, legal framework, compensation, sustainable solutions

Introduction

The Human-elephant conflict is a pressing issue in India, driven by the increasing encroachment of human settlements into elephant habitats. This conflict poses significant risks to both humans and elephants. This study delves into the multifaceted problem of human-elephant conflict, with a particular focus on how Indian legislation, notably the Wildlife Protection Act of 1972, plays a pivotal role in addressing and mitigating this issue. By examining the factors contributing to this conflict, the legal framework in place, and a range of mitigation strategies, this research aims to shed light on the comprehensive approach needed to manage human-elephant conflict in India effectively. It offers valuable insights for policymakers, wildlife authorities, and conservation practitioners in their efforts to safeguard both human communities and the majestic elephants that call India home.

The paper begins by providing an overview of the factors contributing to human-elephant conflict in India, including habitat loss, encroachment, and competition for resources. It then delves into the legal framework surrounding wildlife conservation and protection in India, particularly the Wildlife Protection Act, 1972, and related policies and guidelines. The study discusses various mitigation strategies employed to reduce human-elephant conflict, including:

Habitat management and restoration

The conservation and restoration of elephant habitats play a crucial role in mitigating conflict (Basu 2010). This involves creating and maintaining corridors, protected areas, and elephant reserves to ensure suitable habitats for elephants.

Community participation and awareness

Engaging local communities in conservation efforts is vital for effective conflict mitigation (Athreya 2018). The study explores initiatives that promote community participation, awareness programs, and capacity-building to foster positive attitudes towards elephants and encourage cooperation in conflict management.

Elephants' welfare and relocation

The paper examines measures undertaken to ensure the welfare of elephants and explores the possibility of relocating problematic elephants to reduce conflict risks (*Nationalzoo.si.edu* 2012).

Crop protection and compensation

The study highlights measures such as crop protection techniques, installation of barriers, and compensation schemes for farmers who suffer losses due to elephant crop-raiding incidents (Ghosh 2020).

Early warning systems and technology

The use of technology, including early warning systems, camera traps, and drones, can help detect and prevent human-elephant conflicts by providing timely alerts to communities.

Throughout the analysis, the study underscores the relevance of Indian legislation, such as the Wildlife Protection Act, in guiding and supporting these mitigation strategies (Sheebha & Sangaiah 2014). It also discusses the challenges and limitations associated with their implementation and provides recommendations for improving conflict mitigation efforts. By examining the intersection of human-elephant conflict and Indian legislation, this study contributes to a better understanding of the legal and policy framework for managing such conflicts and provides insights for policymakers, wildlife authorities, and conservation practitioners in developing effective strategies to mitigate human-elephant conflict in India.

Objective

In the realm of legal strategies to mitigate human-elephant conflict, a comprehensive set of objectives has been identified to address the multifaceted nature of this pressing issue. The first set of objectives primarily focuses on safeguarding human interests and well-being. The paramount goal is to protect human lives and property in areas prone to human-elephant conflict, which involves implementing measures to minimize the risk of incidents like property damage, crop raiding, and human injuries or fatalities. Simultaneously, the conservation of elephants is another pivotal objective, aiming to address the root causes of conflict by promoting coexistence and ensuring the long-term survival of elephant populations while respecting their natural habitats and resources.

The second set of objectives encompasses the legal and socio-economic dimensions of human-elephant conflict mitigation. Compliance with existing legal frameworks is essential, as mitigation efforts must align with national wildlife protection acts, environmental laws, and land-use regulations, ensuring that interventions are conducted within established legal boundaries and respect the rights of both humans and elephants. Further, the strategies aim to promote sustainable livelihoods for communities living in conflict-prone areas, aiming to reduce economic losses caused by elephant-related damage to crops and property, ultimately

improving the well-being of affected communities. This objective acknowledges the socio-economic factors that underpin conflicts and seeks to alleviate poverty in these regions.

In essence, these objectives together constitute a holistic approach to addressing human-elephant conflict within the legal realm, with a focus on protecting lives and property, conserving elephants, complying with legal frameworks, promoting sustainable livelihoods, fostering public awareness and participation, conducting research and monitoring, and enhancing collaboration among diverse stakeholders. Such a multifaceted strategy is essential for effectively managing and mitigating the complex challenges posed by human-elephant conflicts in India.

Literature Review

The selection of books presented here forms a diverse and comprehensive literature review on the multifaceted world of elephants and their conservation. Collectively, they paint a vivid picture of the challenges and significance of these majestic creatures in various contexts. "Elephant Destiny" by Meredith (2003) offers a compelling exploration of the challenges faced by African elephants, delving into their biology, behavior, and the critical issues of habitat loss and human-elephant conflict. It underscores the urgent need for conservation efforts and emphasizes the responsibility to protect these iconic animals. Similarly, "The Last Elephants" by Bell and Pinnock (2020) provides a comprehensive examination of the threats to elephants in Africa and offers hope through inspiring examples of conservation initiatives.

On a more personal and scientific level, "Elephant Memories" by Moss (1988) takes readers into the lives of individual elephants over thirteen years, offering intimate insights into their social dynamics and emotional lives. This book deepens our understanding of these remarkable animals and their critical role in ecosystems. "Silent Thunder" by Payne (1999) explores the unique world of elephant communication, shedding light on their complex social interactions and emphasizing the importance of conservation. "Elephants on the Edge" by Bradshaw (2009) offers a thought-provoking examination of the ethical dimensions of human-elephant interactions, challenging conventional perspectives and encouraging empathy and compassion in our relationships with these sentient beings. "The Elephant's Secret Sense" by O'Connell (2007) delves into the sensory world of African elephants, showcasing their remarkable abilities and emphasizing the need for conservation efforts.

The literature review also encompasses broader environmental and ethical issues. "The Sixth Extinction" by Kolbert (2014) highlights the broader context of the current mass extinction crisis, with a focus on the interconnectedness of all species and the need for collective action. "Elephants and Ethics" edited by Wemmer and Christen (2008) takes an interdisciplinary approach to explore the moral dimensions of human-elephant interactions and encourages readers to reflect on our ethical responsibilities towards these animals. "Elephant Complex" by Gimlette (2016) offers a unique perspective on the intertwined history and culture of Sri Lanka and its elephants. Lastly, "The Fate of the Elephant" by Chadwick (2003) is a compelling call to action, shedding light on the urgent need for elephant conservation and highlighting the efforts being made to secure their future.

These books collectively provide a deep and multifaceted understanding of the world of elephants, their conservation challenges, and the ethical dimensions of our interactions with them, making them a valuable resource for anyone interested in the welfare and preservation of these iconic creatures.

The selected articles provide a comprehensive overview of the intricate issues surrounding human-elephant conflict and the management of elephant populations in Africa and India. "Elephant-Human Conflict in Africa: A Literature Review" by Osborn (2002) offers a valuable synthesis of existing literature, shedding light on the multifaceted nature of conflicts between humans and elephants. By analyzing the causes and impacts of these conflicts, Osborn's work serves as an essential resource for researchers, conservationists, and

policymakers engaged in efforts to mitigate human-elephant conflicts. Additionally, it emphasizes the importance of informed decision-making, grounded in a deep understanding of the complexities involved in coexisting with these majestic animals.

"Human-Elephant Conflict in India: A Review of Socioeconomic Drivers and Mitigation Efforts" by Reddy and N. Reddy (2015) delves into the specific socioeconomic drivers of human-elephant conflict in India and examines the diverse range of mitigation strategies in place. This review underscores the need to consider the broader context of land use changes, urbanization, and cultural dynamics that contribute to these conflicts. It also provides a critical evaluation of the effectiveness of various mitigation approaches, highlighting the significance of interdisciplinary research and stakeholder collaboration. This work is instrumental in guiding future conservation efforts in India and offers a holistic understanding of the challenges associated with human-elephant conflict, making it a valuable resource for policymakers, researchers, and conservation practitioners.

Moreover, "A Decision-Making Framework for Elephant Management" by Hoare (2000) presents a comprehensive and ethical approach to elephant management. Hoare's framework recognizes the ecological and social complexities inherent in managing elephant populations and emphasizes the importance of making decisions based on a solid understanding of these factors. The framework not only considers the biological needs of elephants but also the well-being of local communities and ethical considerations, providing a valuable tool for guiding elephant management decisions that prioritize the coexistence of humans and elephants.

In addition, "Predicting Spatial Aspects of Human-Elephant Conflict" by Sitati, Walpole, and Smith (2003) takes a proactive approach by focusing on the spatial patterns of human-elephant conflict. By identifying areas of higher conflict potential through a predictive model, this study offers practical tools for wildlife managers and policymakers to target interventions effectively, thereby reducing conflicts and mitigating risks for both humans and elephants.

Lastly, "Agroforestry, Elephants, and Tusklessness in Africa" by Nyhus and Tilson (2004) explores the fascinating relationship between agroforestry practices and the occurrence of tusklessness in African elephants. The paper contributes to the understanding of how human-induced land-use changes can influence the genetic traits of elephant populations, shedding light on the ecological consequences of such practices and emphasizing the need for sustainable land-use strategies that consider the long-term impacts on elephant populations and genetic diversity. Collectively, these articles offer a comprehensive and multifaceted understanding of the challenges and solutions related to human-elephant conflict and elephant management, making them essential resources for those working towards the coexistence and conservation of these magnificent creatures.

Legal Loopholes in Mitigating Human-Elephant Conflict

Human-elephant conflict is a significant and complex issue with profound implications for both human communities and elephant populations. The study underlines the critical need for legal mechanisms that effectively address this conflict, given the overlapping territories of humans and elephants that often lead to confrontations and risks for both parties. It highlights various legal loopholes that currently hinder the mitigation of human-elephant conflict. These include inadequate legislation, enforcement challenges, coordination gaps among stakeholders, compensation and livelihood issues, and limited resources. The existence of these loopholes can result in a lack of clarity, weak accountability, and fragmented approaches, ultimately impeding the effective resolution of this conflict.

In response to these challenges, the study advocates for comprehensive legal solutions that specifically target human-elephant conflict. This includes the development of robust legislation tailored to address the nuances of this issue, as well as strengthening enforcement mechanisms to ensure accountability and deter offenders. Additionally, the study emphasizes

the importance of enhanced coordination among various stakeholders involved, such as government agencies, local communities, and conservation organizations, to create a more cohesive and effective approach to conflict mitigation. Addressing compensation and livelihood issues, and securing sufficient resources for mitigation efforts, are also highlighted as essential components of a comprehensive strategy. By shedding light on these legal shortcomings and proposing solutions, the study contributes to the ongoing efforts aimed at mitigating human-elephant conflict, ultimately promoting harmonious coexistence between humans and elephants while safeguarding the interests of both parties.

Strategies Implementation Loopholes in Mitigating Human-Elephant Conflict

Human-elephant conflict poses a significant challenge in regions where human populations and elephants share common landscapes. Mitigating this conflict is crucial for the well-being of both communities and elephants. The study provides an insightful examination of the strategies commonly used to address human-elephant conflict, emphasizing the paramount importance of their effective implementation. These strategies encompass habitat management, community engagement, early warning systems, and crop protection measures, all of which contribute to creating a harmonious coexistence between humans and elephants.

However, the study uncovers several critical loopholes in the implementation of these conflict mitigation strategies. These loopholes encompass issues such as inadequate awareness and education, insufficient funding and resources, poor coordination and collaboration among stakeholders, inadequate monitoring and evaluation mechanisms, and gaps in existing legal and policy frameworks. These challenges can collectively hinder the successful execution of mitigation measures, delaying or impeding the achievement of desired outcomes. In response to these implementation challenges, the study advocates for a comprehensive set of solutions. These include prioritizing awareness and education efforts to engage local communities and stakeholders effectively, securing adequate funding and resources to support mitigation activities, fostering stronger coordination and collaboration among the various parties involved, enhancing monitoring and evaluation mechanisms to assess the impact of strategies, and reviewing and updating legal and policy frameworks to address gaps and inconsistencies. By addressing these implementation loopholes and proposing solutions, this study contributes significantly to the ongoing endeavors to mitigate human-elephant conflict. It underscores the imperative of not only developing effective strategies but also ensuring their efficient execution to foster peaceful coexistence between humans and elephants in shared landscapes.

Human-Elephant Conflict- Landmark Cases and the Role of Judiciary

Human-elephant conflict has been a recurring issue in many countries, including India, where the shrinking habitats of elephants and the expansion of human settlements have resulted in increased encounters and conflicts between humans and elephants. In addressing this complex problem, the role of the judiciary and landmark legal cases play a crucial role in shaping policies and decisions related to human-elephant conflict mitigation. Landmark cases related to human-elephant conflict have provided important precedents and guidelines for addressing the issue. These cases often involve conflicts between conservation efforts and the rights and livelihoods of local communities living in proximity to elephant habitats. The judiciary plays a significant role in balancing these competing interests and ensuring the protection of both human and elephant populations. One such landmark case in India is the *T.N. Godavarman Thirumulpad v. Union of India case*, commonly known as the Forests Rights Act case. This case addressed the rights of forest-dwelling communities and their entitlement to traditional forest resources. The judgment recognized the importance of including local communities in decision-making processes regarding forest conservation and management, which is relevant to mitigating human-elephant conflict. Another

notable case is the *Wildlife First v. Ministry of Forest and Environment case*, which focused on the implementation of wildlife protection laws and the need for comprehensive management plans for protected areas. This case emphasized the significance of ensuring the well-being of both humans and wildlife, including elephants, and the need for effective management strategies to reduce conflicts.

The judiciary's role in human-elephant conflict extends beyond individual cases. It also plays a vital role in interpreting and enforcing existing laws and regulations related to wildlife conservation, land use, and community rights. Through their judgments and directives, courts can influence policy decisions, establish guidelines for conflict mitigation measures, and hold authorities accountable for their implementation. The judiciary's involvement in human-elephant conflict cases has contributed to the development of guidelines and best practices for conflict mitigation. These may include recommendations for habitat management, community engagement, compensation schemes, and the use of technology for early warning systems. Furthermore, the judiciary's interventions have helped raise awareness about human-elephant conflict and the need for sustainable solutions. They have created platforms for stakeholders to voice their concerns and engage in dialogue, fostering a collaborative approach to conflict mitigation.

In summary, landmark cases and the role of the judiciary are instrumental in addressing human-elephant conflict. Through their judgments, the judiciary provides legal clarity, establishes precedents, and guides the formulation and implementation of policies and measures for conflict mitigation. Their decisions consider the rights and welfare of both humans and elephants, striking a balance between conservation efforts and the well-being of local communities.

Human-Elephant Conflicts in Odisha: A Decade-Long Empirical Analysis

This empirical study aims to analyze the human-elephant conflicts in the state of Odisha, focusing on the number of elephant and human casualties over the last decade. The data available includes the total number of surviving elephants is 1976, annual human deaths due to elephant attacks, and elephant deaths in human-elephant conflicts. The study provides insights into the severity of the issue and the impact on both elephants and human populations.

Methodology

Data Collection: The primary data used in this study includes the Odisha 2017 census data, which provides the initial count of surviving elephants was 1976. Additional data on annual human deaths due to elephant attacks and elephant deaths in human-elephant conflicts have been collected from reliable sources, such as official records and reports (through RTI).

Data Analysis: The collected data are analyzed to derive meaningful insights. The main focus is on comparing the number of elephant and human deaths over the last decade (from 2013 to 2022).
Analysis and Findings:

Initial Elephant Population: According to the Odisha 2017 census data, the state is home to a total of 1976 surviving elephants, with an unfortunate annual average of approximately 80 elephants tragically succumbing to death.

Human Deaths in Elephant Attacks: It has been reported that around 133 people die every year in elephant attacks. Therefore, over the last decade, the estimated number of human deaths would be 1,330 (133 x 10).

Elephant Deaths in Human-Elephant Conflicts: The available data states that around 80 elephants die in human-elephant conflicts each year. Consequently, during the last decade, a total of 800 elephants (80 x 10) have died.

Elephant and Human Casualties in the Last Decade: As of 07.02.2023, the recorded data shows that 784 elephants and 947 humans have lost their lives during the same time period.

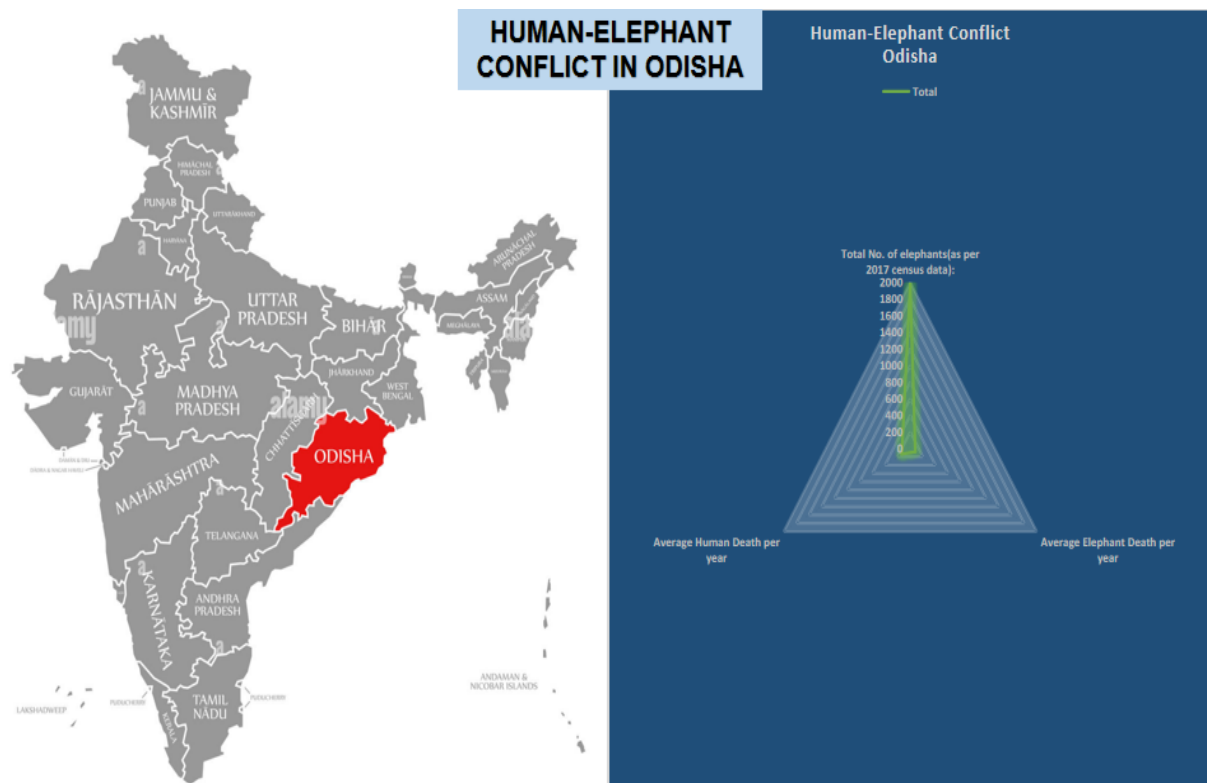


Figure 1. Human-Elephant Conflict in Odisha

The analysis of the data indicates that human-elephant conflicts in Odisha have led to significant casualties for both elephants and humans. The last decade has witnessed a heart-wrenching toll of 784 elephant deaths and 947 human fatalities, underscoring the profound sorrow caused by human-elephant conflicts. These findings emphasize the urgent need for effective measures to mitigate human-elephant conflicts and ensure the coexistence of both species. Further research and initiatives should be undertaken to develop strategies that promote peaceful interactions between humans and elephants while preserving their habitats and minimizing risks to human lives.

Conclusions

In conclusion, compensation has emerged as a sustainable solution in human-elephant conflict mitigation strategies within the legal realm. The provision of compensation to affected individuals or communities for losses incurred due to elephant-related damage or conflicts serves multiple purposes. Firstly, it addresses the immediate economic impact on farmers, households, or businesses, mitigating their financial burden and providing them with the means to recover and rebuild. This contributes to the overall well-being and stability of affected communities. Secondly, compensation acts as an incentive for communities to actively participate in conflict management efforts. By recognizing the losses incurred and offering fair compensation, it fosters a sense of trust and cooperation between local communities and conservation authorities. This partnership is crucial in implementing long-term sustainable solutions to mitigate human-elephant conflicts effectively. Furthermore, compensation can serve as an indirect conservation measure by incentivizing communities to engage in sustainable practices that reduce conflict risks. For instance, offering compensation for adopting crop protection techniques or implementing elephant-friendly agricultural practices encourages coexistence and reduces the likelihood of confrontations between humans and elephants. However, it is important to ensure that compensation schemes are well-designed, transparent, and equitable. Clear guidelines and

procedures should be established to assess and determine compensation amounts objectively. Adequate funding and efficient administrative mechanisms are necessary to ensure timely and fair disbursement of compensation to affected individuals or communities. While compensation is a valuable tool in human-elephant conflict mitigation, it should be complemented with other strategies such as habitat management, community participation, and public awareness. A holistic approach that combines legal frameworks, sustainable livelihoods, research, and collaboration among stakeholders is essential for effective and long-lasting solutions to human-elephant conflicts.

In conclusion, compensation serves as a sustainable solution within the legal realm of human-elephant conflict mitigation strategies. By providing financial support to affected individuals or communities, it not only addresses immediate economic losses but also incentivizes cooperation, promotes conservation-friendly practices, and fosters a sense of shared responsibility. By incorporating compensation alongside other strategies, a comprehensive approach can be achieved to minimize human-elephant conflicts and promote harmonious coexistence.

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